June 16, 1942. G. SAUER 2,286,441

SEWING MACHINE

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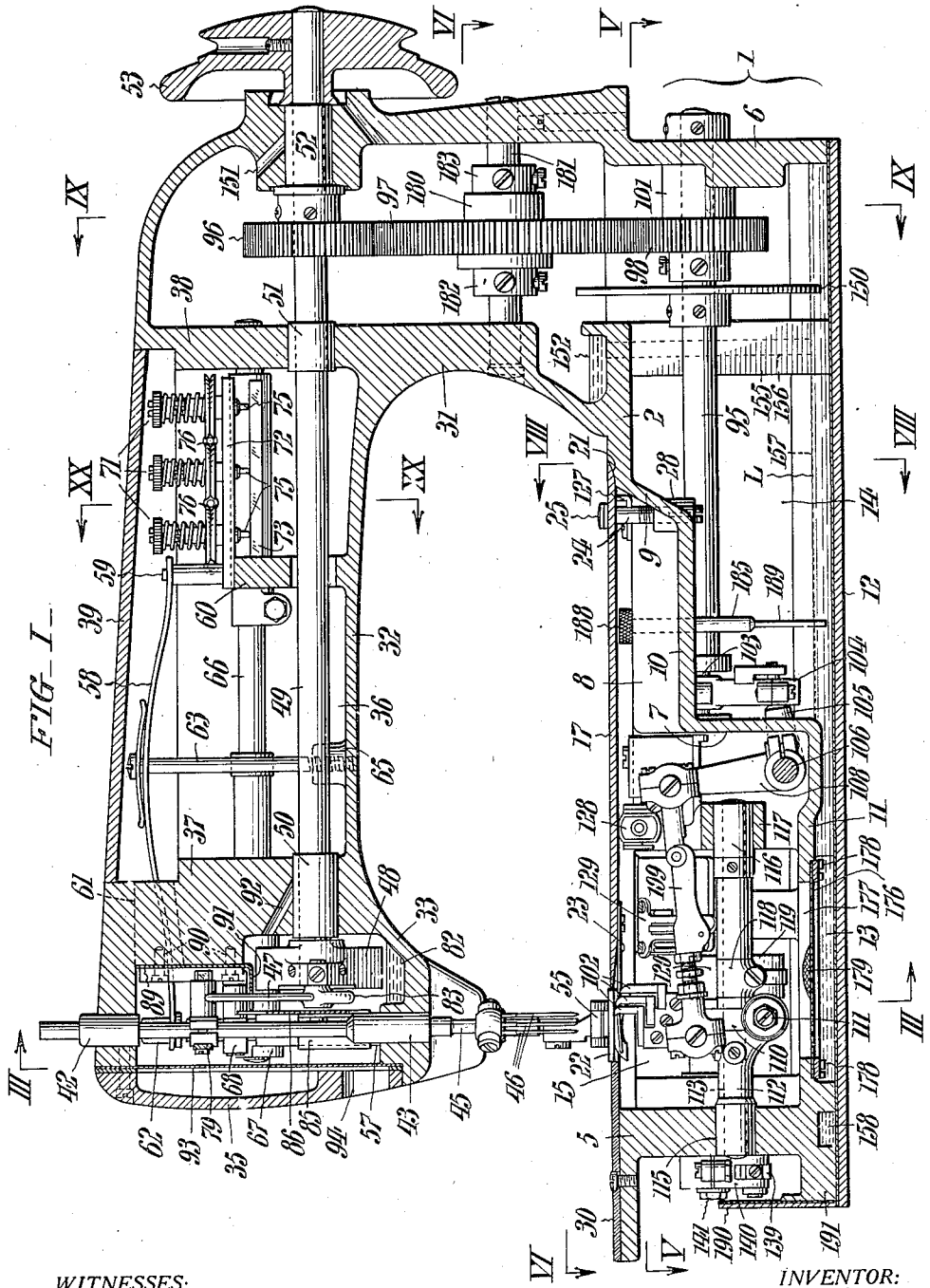


FIG. I.

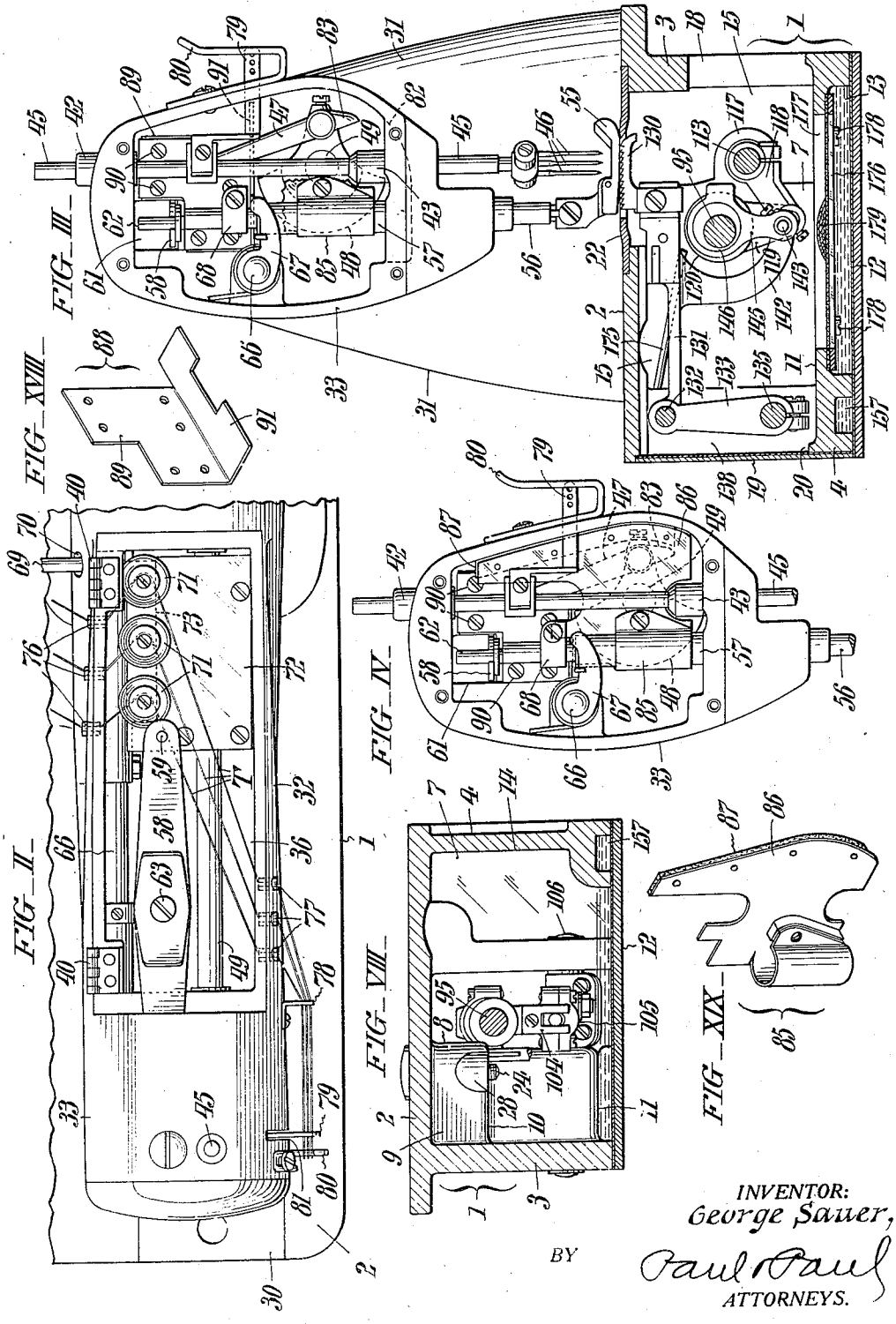
WITNESSES:
Hubert Fuchs
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June 16, 1942. G. SAUER 2,286,441

SEWING MACHINE

Filed Feb. 6, 1940 8 Sheets-Sheet 2



INVENTOR:
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June 16, 1942. G. SAUER 2,286,441

SEWING MACHINE

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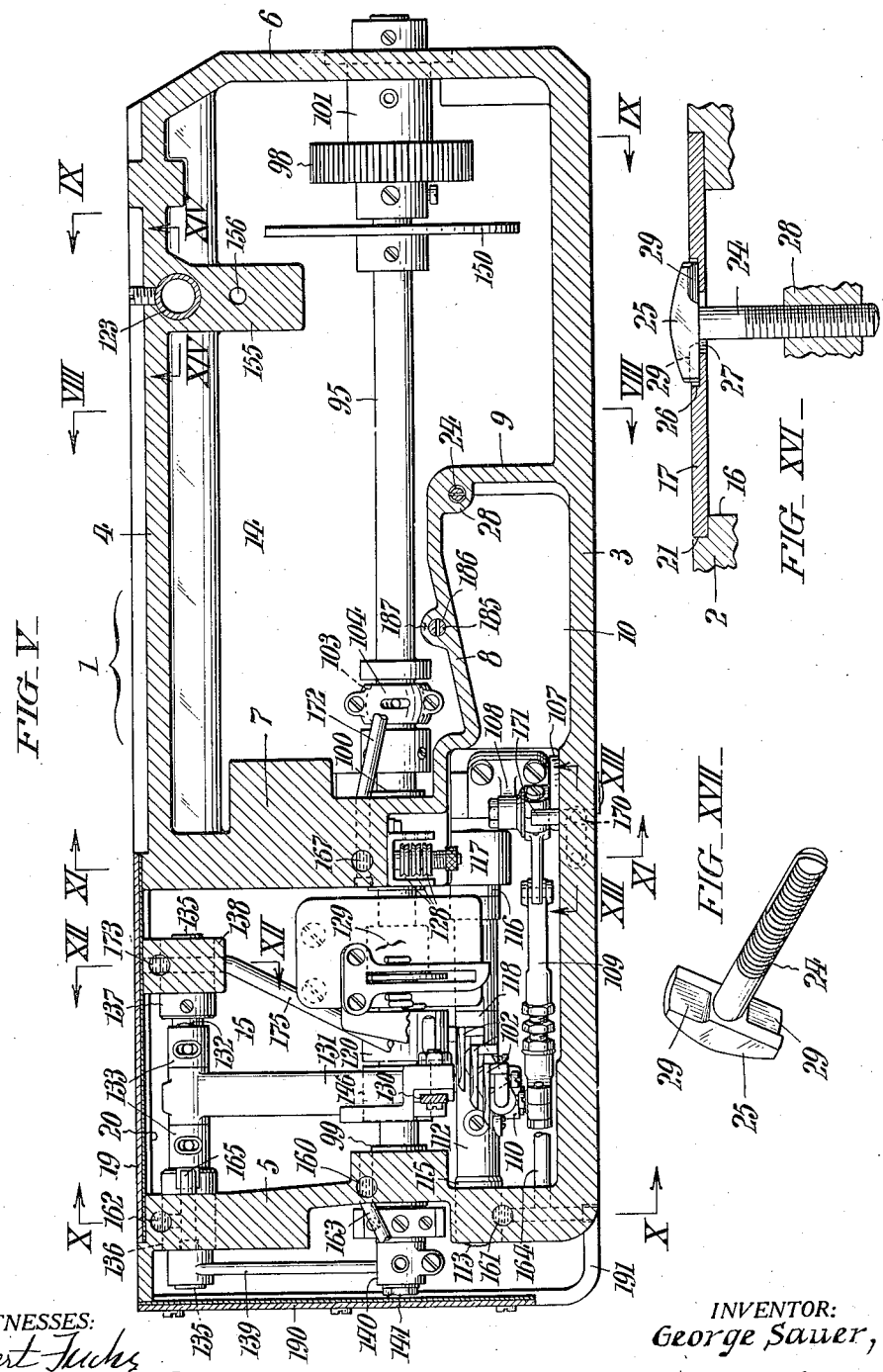


FIG. V

FIG. XVI

FIG. XVII

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SEWING MACHINE

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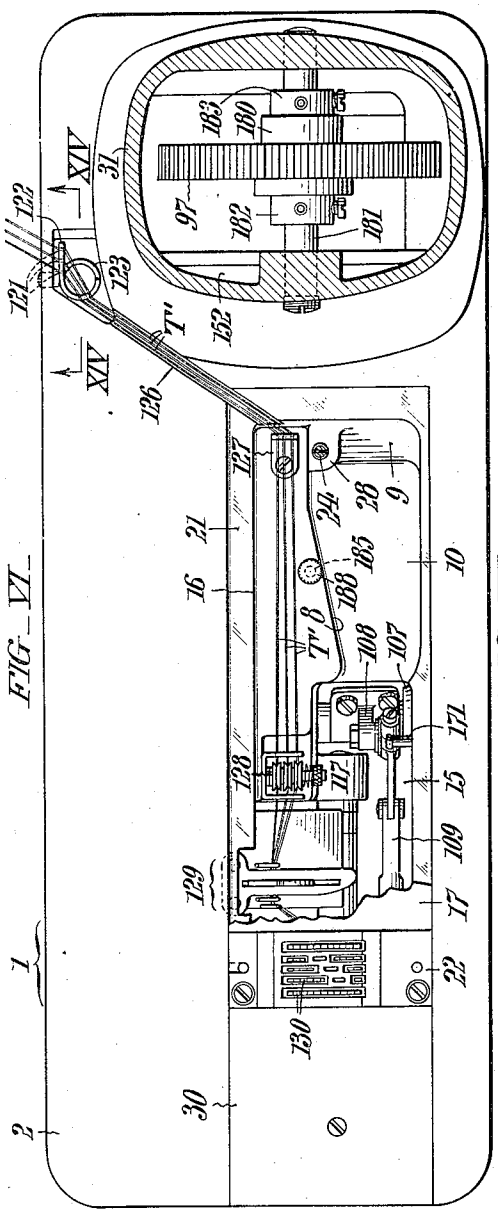


FIG. VI.

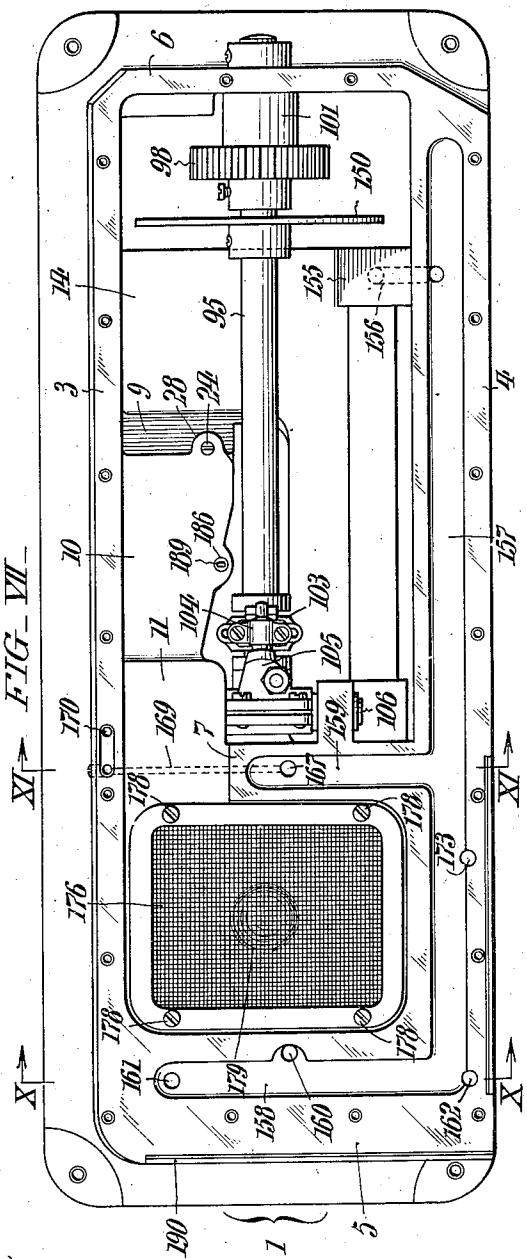


FIG. VII.

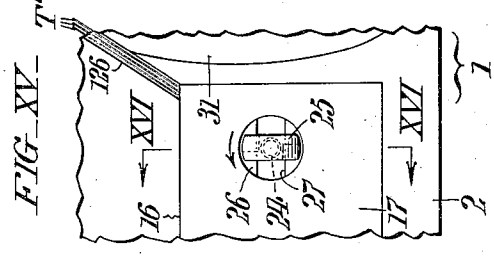


FIG. XV.

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SEWING MACHINE

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FIG. IX.

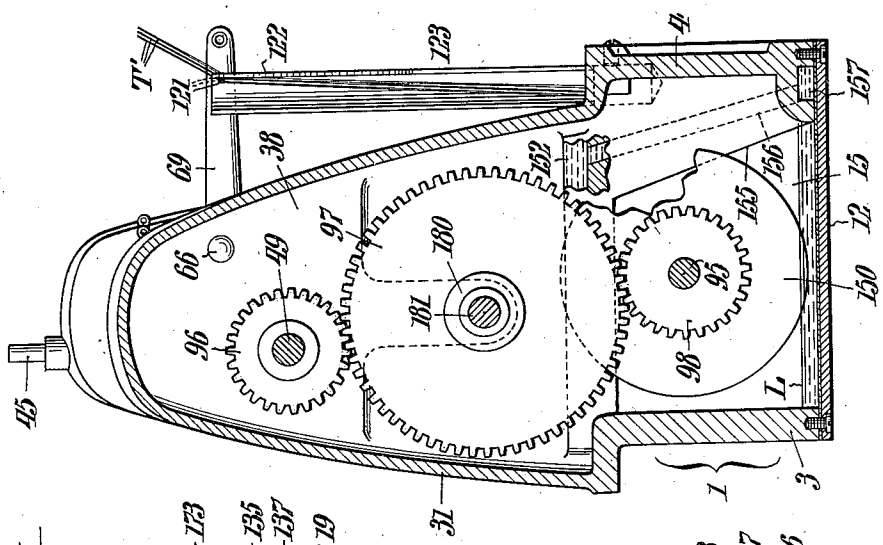


FIG. XII.

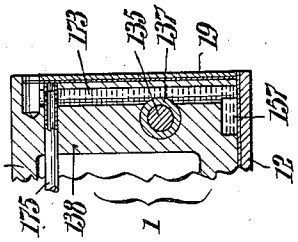


FIG. XIII.

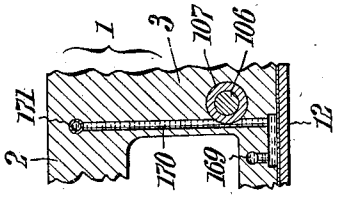


FIG. X.

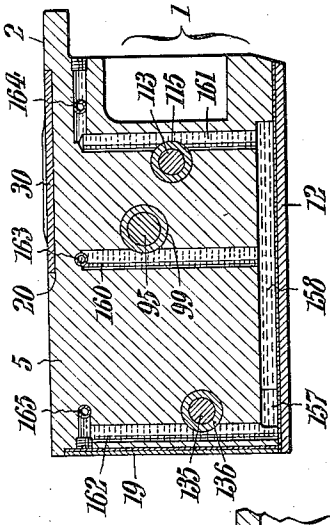


FIG. XI.

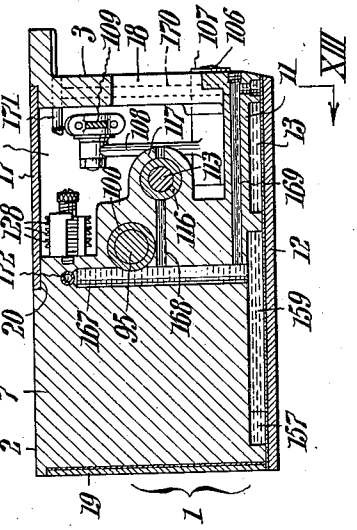
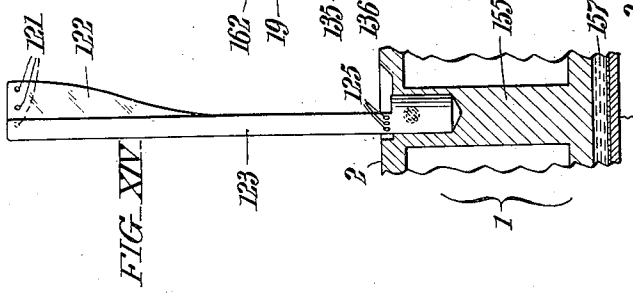


FIG. XIV.



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SEWING MACHINE

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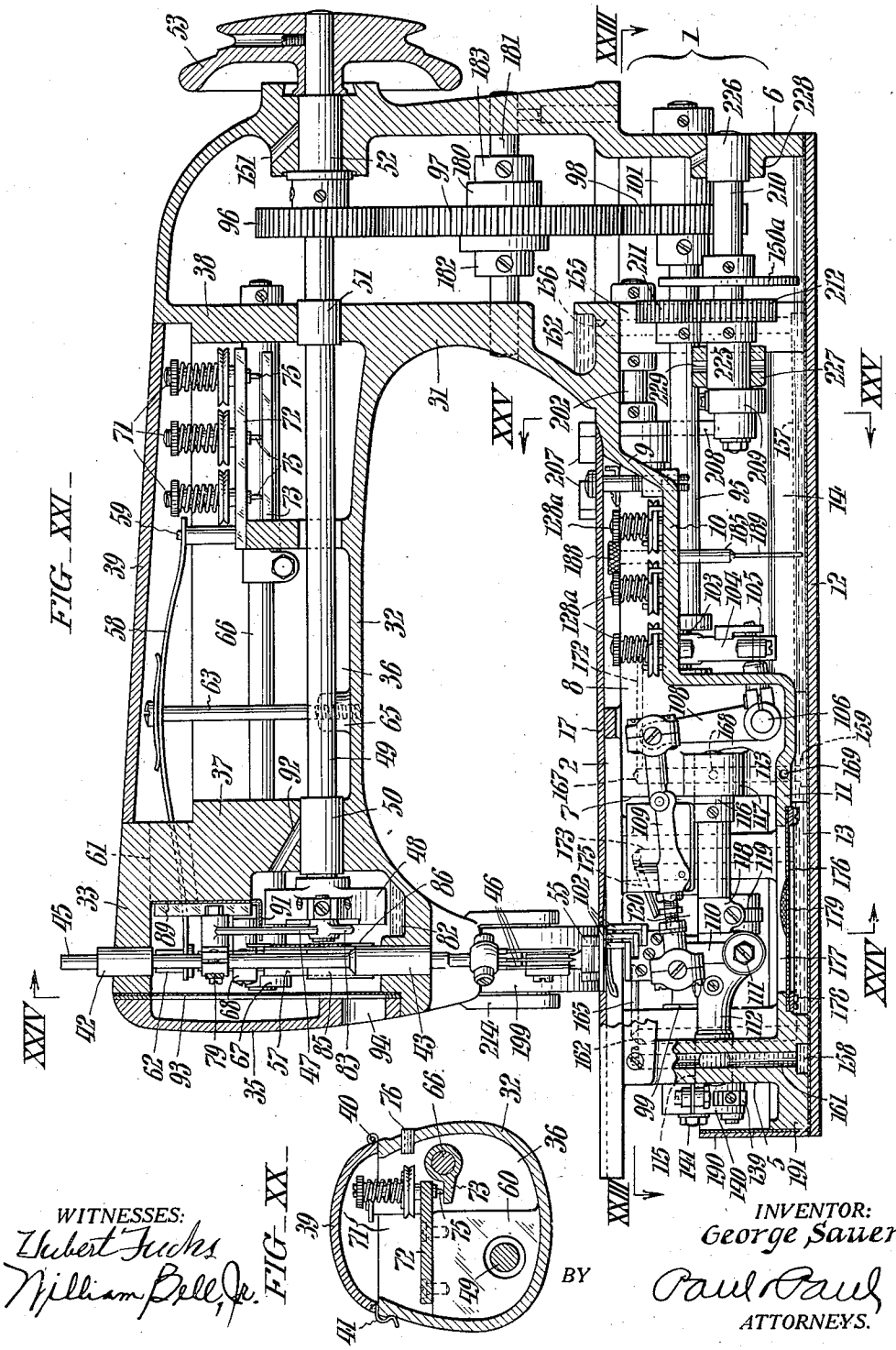


FIG. XXI.

FIG. XX.

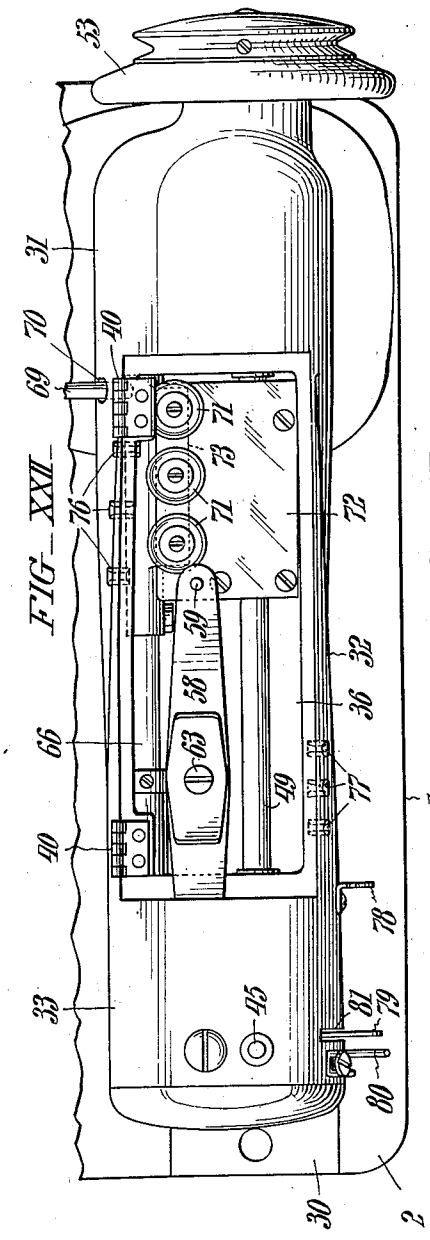
WITNESSES:
Hubert Fuchs
William Bell, Jr.

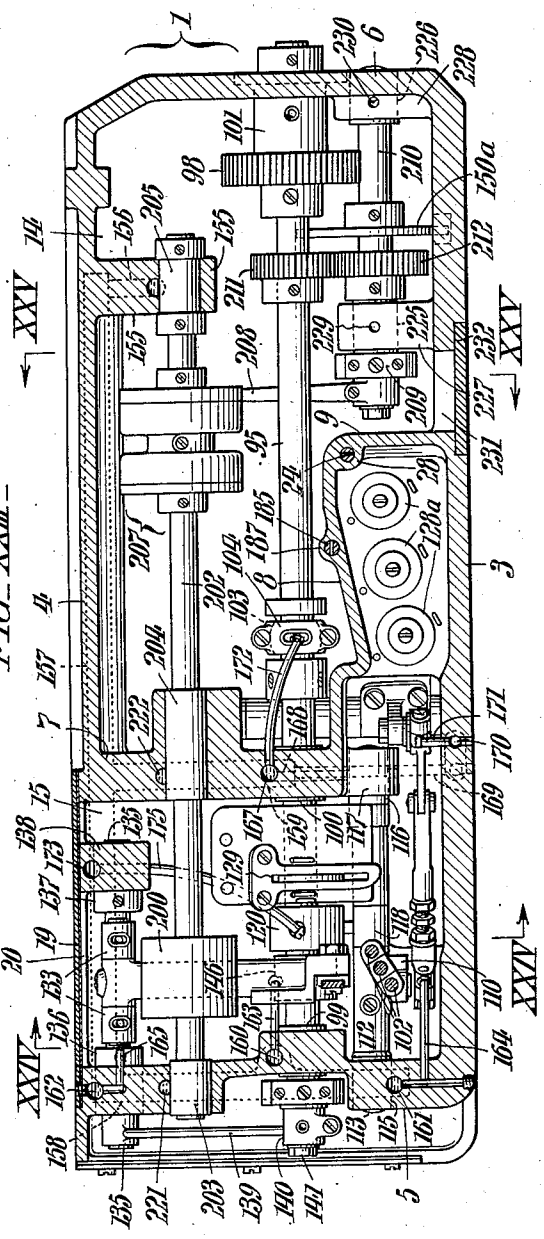
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June 16, 1942. G. SAUER 2,286,441

SEWING MACHINE

Filed Feb. 6, 1940 8 Sheets-Sheet 7





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SEWING MACHINE

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FIG. XXVI.

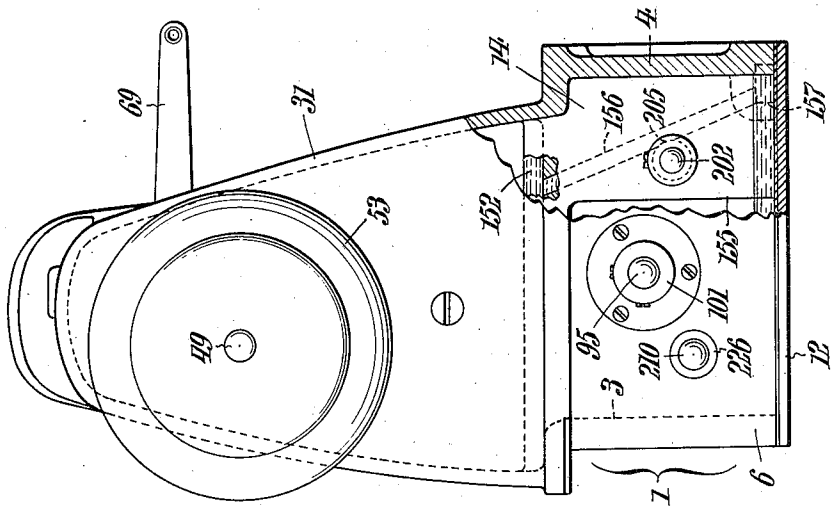


FIG. XXIV.

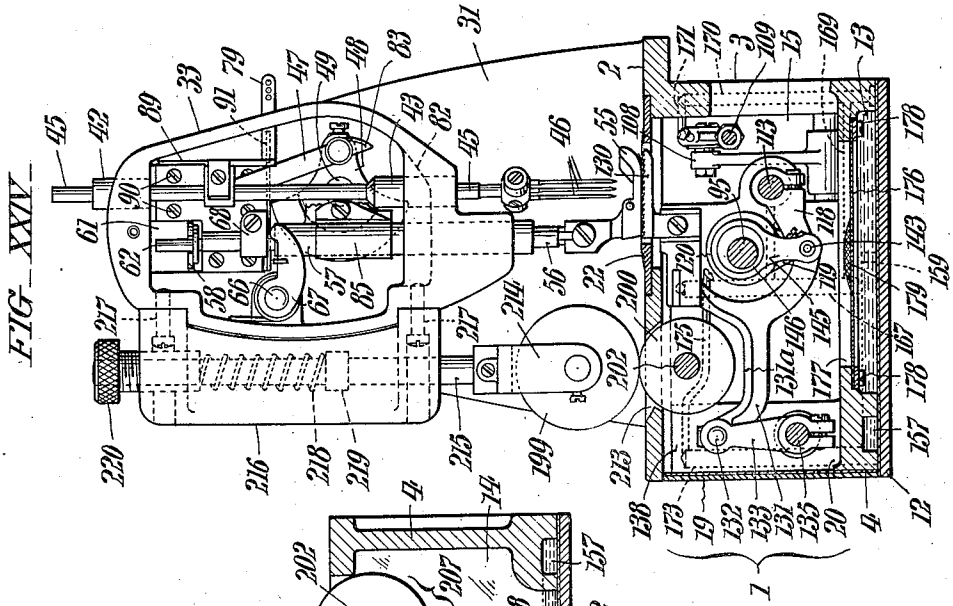
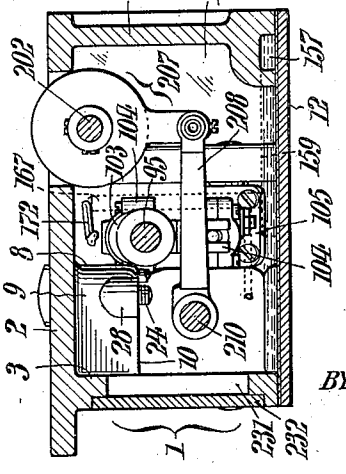


FIG. XXV.



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Patented June 16, 1942 2,286,441

UNITED STATES PATENT OFFICE

2,286,441

SEWING MACHINE

George Sauer, Berwyn, Ill., assignor to Union Special Machine Company, Chicago, Ill., a corporation of Illinois

Application February 6, 1940, Serial No. 317,517

25 Claims. (Cl. 112—256)

This invention relates to sewing machines, and has reference more especially to chain stitch sewing machines of the flat bed type. In such machines the bed is usually of open construction throughout, and various moving parts, for example, of the feed, the looper and the drive mechanisms except for being shielded from above by the work support at the top of the bed or base, are exposed and must be lubricated either by application of oil directly to them individually, or by way of oiling holes in the work support. Although enclosed within the end of the usual overhanging arm of the machine frame, the parts of the needle operating mechanism of such machines, as ordinarily constructed, must also be individually lubricated either by application of oil directly to them (upon removal of one or more cover plates), or by way of oiling holes in said arm. Due to the great number of parts which require lubrication, oiling under these circumstances is a tedious and time consuming task, and on this account is either neglected altogether or carelessly done by the operators of the machines; and when done is invariably attended by oil flooding and spillage with resultant soiling of the work afterwards stitched in the machines.

My invention has for its chief aim to overcome the above drawbacks. This objective I attain, as hereinafter more fully set forth, by enclosing the parts of the looper, feed and drive mechanisms, insofar as is possible, within chambers formed in the machine bed or base; by providing means which takes oil from a supply in the base and disperses it in such a way that part of it falls directly on some of the enclosed moving parts; by providing an auxiliary reservoir by which part of the dispersed oil is trapped and conducted through channelling and ducts in the walls and partitions of the base to all the other enclosed moving parts; and by providing in addition, wick filled ducts which deliver oil from within the base through its walls to the moving parts exteriorly of said chambers.

Another object of my invention is to provide for automatic lubrication of the needle operating mechanism which is accomplished, as also hereinafter more fully set forth, by dispersing oil within the needle head from a supply maintained in a well at the base of the latter.

I furthermore make provisions within the head to prevent excess oil from reaching the guide bearings through which the needle and presser bars extend at the bottom of the needle head, and also to preclude escape of oil through the clearance openings in the sides of the head through which moving parts extend to the exterior.

In addition, provisions are made within hollows or chambers of the machine frame in accordance with my invention for the accommodation and protection of the needle and looper thread tensions, as well as for the guidance of the threads with assurance against contamination with oil.

In connection with a sewing machine characterized as above and embodying puller rollers to assist in feeding, it is a further aim of my invention to provide for the accommodation of the puller roller actuating mechanism within the base so that it may be automatically lubricated with oil taken from the same source which is used for the looper and feed mechanisms.

Other objects and attendant advantages of my invention will appear from the following detail description of the attached drawings wherein—

Fig. I is a vertical longitudinal sectional view of a sewing machine conveniently embodying the present improvements.

Fig. II shows the machine in top plan with a retractable top cover of the hollow needle arm removed to expose the parts within said arm.

Fig. III is a view partly in elevation and partly in section taken as indicated by the angled arrows III—III in Fig. I, with the end cover of the needle head removed, with one of the oil shields within the needle head broken away to expose the parts of the needle operating mechanism which lies behind it.

Fig. IV is a view corresponding to Fig. III with the oil shields intact.

Fig. V is a horizontal sectional view of the machine at a level below the top of the base taken as indicated by the angled arrows V—V in Fig. I.

Fig. VI is a horizontal sectional view at a higher plane taken as indicated by the angled arrows VI—VI in Fig. I.

Fig. VII shows the machine in bottom plan with the base bottom removed.

Fig. VIII is a transverse sectional view of the machine taken as indicated by the angled arrows VIII—VIII in Figs, I and V.

Fig. IX is a transverse sectional view taken as indicated by the angled arrows IX—IX in Figs. I and V.

Figs. X and XI are cross sectional views taken as indicated by the angled arrows X—X and XI—XI in Figs. V and VII.

Fig. XII is a fragmentary detail section taken as indicated by the angled arrows XII—XII in Fig. V.

Fig. XIII is a fragmentary detail section taken as indicated by the angled arrows XIII—XIII in Figs. V and XI.

Fig. XIV is a fragmentary detail sectional view taken as indicated by the angled arrows XIV—XIV in Figs. V and VI.

Fig. XV is a fragmentary view showing a portion of the top of the base (which constitutes the work support of the machine) in plan.

Fig. XVI is a detail sectional view taken as indicated by the angled arrows XVI—XVI in Fig. XV.

Fig. XVII is a perspective view of a screw bolt by which a top cover plate for the base of the machine is secured in place.

Figs. XVIII and XIX are perspective views of guards which shield certain parts of the needle operating mechanism from the splash of lubricant in the needle head.

Fig. XX is a cross sectional view of the needle arm machine taken as indicated by the angled arrows XX—XX in Fig. I.

Fig. XXI is a view corresponding to Fig. I showing a modified form of my improved sewing machine with puller means.

Fig. XXII is a view corresponding to Fig. II showing the top plan of the modified machine.

Fig. XXIII is a horizontal section of the modified machine taken as indicated by the angled arrows XXIII—XXIII in Fig. XXI.

Fig. XXIV is a transverse sectional view of the modified machine taken as indicated by the angled arrows XXIV—XXIV in Figs. XXI and XXIII.

Fig. XXV is a cross sectional view of the modified machine taken as indicated by the angled arrows XXV—XXV in Figs. XXI and XXIII; and

Fig. XXVI is an end elevation looking toward the right hand end of the machine in Fig. XXI with a portion of the frame broken out and in section.

Referring first more particularly to Figs. I—XX, the frame of my improved sewing machine has a hollow base 1 with a top wall 2 which constitutes the work support, front and rear side walls 3 and 4, and end walls 5 and 6. A partition extends part way crosswise of the base as at 7 (Fig. V) from the rear wall 4, then longitudinally for a distance as at 8, then again transversely as at 9 to meet the front wall 3. This partition moreover, is depressed as at 10, and at the bottom merges with a horizontal partition 11 which extends leftward in Fig. I to meet the end wall 5. The hollow of the base 1 is closed at the bottom by a removable cover plate 12, with incidental provision of a shallow interspace at 13 below the horizontal partition 11 or bottom of the chamber 15. As a consequence of this construction, the base is subdivided into two compartments 14, 15 whereof the first extends beneath the second at 13, and whereof a laterally-offset portion of the second extends horizontally over the first as at 10. The lateral offset portion 10 of the chamber 15 is accessible through an opening 16 in the top wall 2 of the base upon withdrawal of a cover plate shown at 17. The chamber 15 is, moreover, open at the front as a consequence of the omission of a portion of the side wall 3 at 18, (Figs. III and XI) but closed at the back by a removable cover plate 19 which extends crosswise of a similar omission at the rear wall 4 at 20 (Figs. III and V).

As shown in Figs. I, X and XI, the top cover plate 17 fits into a perimetric depression 21 around the opening 16 so as to be flush with the upper face of the top wall 2 of the base and thus provide a continuous surface over which the work is progressed during the sewing. The left hand end of the cover plate 17 (Figs. I and VI) abuts against the contiguous edge of a throat plate 22 which also fits the recess 21 as shown, and a spring clip 23 attached to the bottom of the cover plate at the left hand end in Fig. I underreaches the contiguous edge of said throat plate to assist in retaining said cover plate in position. The cover plate 17 is, however, secured against accidental displacement by a screw bolt 24 which is illustrated in perspective in Fig. XVII. As shown, this screw bolt 24 has a smoothly rounded oblong head 25 which seats within an annular recess 26 in said plate, see Figs. XV and XVI, and the threaded shank of which extends down through a diametrical slot 27 within the confines of said recess and engages in a boss 28 on the depressed portion 10 of the cross partition. The width of the slot 27 corresponds with that of the bolt head 25 so that by a quarter rotation of the bolt, said head will be cleared to permit upward withdrawal of the cover plate 17. On its under side, the head 25 has cam slopes 29 which coact with the side edges of the slot 27 in the plate 17 as said head is turned crosswise of said slot to secure the plate.

The left hand end of the opening 16 in the top wall 2 of the base is closed by a supplemental plate 30 which abuts the throat plate 22 within the recess 21.

Integrally formed with the base 1 and rising therefrom at one end, is a trunk or standard 31 which is hollow and which at the bottom communicates directly into the hollow of the base. In turn, integrally formed with the standard is a hollow horizontal arm 32 which overreaches the base 1, and which, at its free end, terminates in a hollow head 33 having a removable cover 35. A central chamber 36 is set apart within the hollow of the arm by a partition 37 which serves as the back wall of the head and a partition 38 in upper continuation of the left hand side wall (Fig. I) of the standard 31. As shown in Figs. I, II and XX, the central chamber 36 of the arm 32 has a cover 39 which is connected along the rear edge by hinges 40, and which is engaged at its front edge by a spring catch 41.

Guided for up and down movement in bushings 42 and 43 at the top and bottom of the head 33, is a bar 45 which, at its lower end, carries a plurality of needles 46. The needle bar 45 is moved up and down endwise through a pitman 47 (Figs. I and III) from a counterbalanced crank member 48 at the left hand end (Fig. I) of a rotary shaft 49 which revolves in bearings 50 and 51 respectively set into the partitions 37 and 38. The shaft 49 also has journal support in a bearing 52 set into the right hand side wall of the standard 31 where it protrudes to the exterior and carries a combined hand and belt wheel 53.

The machine furthermore has a presser foot 55 at the lower end of a presser bar 56 which extends upward through a guide bushing 57 set into the bottom of the needle head 33. The presser bar 56 is subject to the action of a leaf spring 58 which, as shown in Fig. I, is housed within the hollow of the arm 32. At its right hand end,

the spring 58 is apertured to engage a stud 59 at the top of a cross web 60 (Fig. I) within the arm 32. The left hand end of the spring 58 extends through a clearance opening 61 in the partition 37 and is bifurcated as shown in Fig. III, to engage over the bottom flange of a thimble or stirrup like connection 62 at the top end of the presser bar 56 within the needle head 33. The pressure of the spring 58 is regulatable by means of a screw 63 which is accessible upon retraction of the top cover 39 for the central chamber 36 of the arm 32, and which, at its lower end, threadedly engages into a boss 65 at the bottom of said arm. For the purpose of lifting the presser foot as is desirable to initially introduce the work beneath it, I have provided the machine with means including a rock shaft 66 which is suitably journalled at its ends in the partitions 37 and 38 within the hollow of the arm 32 and which extends into the hollow of the head 33 where it carries a finger 67 that underreaches a collar 68 on the presser bar 56. Affixed to the shaft 66, within the central chamber 36 of the arm 32 is a lever 69 which passes through a clearance opening 70 in the rear side of the arm 32 to the exterior for connection by a chain or link to an actuating knee press or foot treadle, not illustrated.

Also located within the central chamber 36 of the arm 32 are tensions 71 for needle threads indicated by the letter T, said tensions being mounted on a plate 72 suitably sustained by one of the side walls of the arm and the cross web 60, and being releasable by encounter of a wing 73 on the shaft 66 with the bottom ends of the stems 75 of the tensions. Thus when the shaft 66 is operated to lift the presser foot 55, the tension on the needle threads T is concurrently relieved. The needle threads T pass from suitable sources of supply (not illustrated) through individual guide eyes 76 (Figs. II and XX) in the rear of the arm 32 to the tensions 71 within the chamber 36, and from thence pass out through individual guide eyes 77 in the front of said arm to a fixed guide 78 en route to a take-up 79 (Figs. II, III and IV). After leaving the take-up 79, the threads T run over a wire guide 80 at the front side of the needle head 33, and finally pass from thence to the needles 46. The take-up 79 is in the form of a finger, which, as shown, is connected to the needle bar 45 within the hollow of the head 33, and which extends laterally through a narrow slot 81 at the front of said head immediately adjacent the guide 80.

As shown in Fig. I, the needle head 33 extends somewhat below the arm 32 and at the bottom is formed with a well 82 for lubricant which is conventionally indicated in the drawings. During rotation of the shaft 49 a spoon 83 at the lower end the pitman 47 dips intermittently into the well 82 to splash oil about within the head 33 and thus automatically lubricate the parts of the needle operating and the presser bar operating means. It is to be particularly noted that the guide bushings 43 and 57 respectively for the needle bar 45 and the presser bar 56 extend considerably above the oil level in the well 82 to insure against direct leakage of the lubricant through them. Clamped to the upper end of the guide bushing 57 for the presser bar 56 within the head 33 is a shield element 85 which is illustrated in perspective in Fig. XIX and which has a wing 86 with a sealing strip 87 engaging one of the side walls of said head. As shown in Fig. 1, the wing 86 extends between the crank member 48 on the shaft 66 within the head 33 and the needle bar 45 and so prevents direct access of the splash oil onto the needle bar. Another shield 88 of angular configuration (Figs. I and XVIII) has its vertical portion 89 secured by screws 90 to the partition 37 within the head 33. The laterally extending bottom portion 91 of the shield 88 acts to further prevent an excess amount of the splash lubricant from reaching the moving parts of the needle operating mechanism contiguous to the needle and presser bars 45 and 56, and also prevents splash of oil through the opening 61 in the partition 37 by way of which the presser spring 58 enters the head 33. The bearing 50 for the shaft 49 is lubricated by oil entering it from the head 33 by way of a duct 92 in the partition 37.

Interposed between the open end face of the needle head 33 and its cover 35 is a sheet 93 of transparent material which acts as a sealing means. The sheet 93 also serves as a transparency cross a small window opening 94 in the cover 35 through which the supply of the oil within the well 82 can be checked from time to time.

Extending longitudinally through the hollow of the base 1 is a rotary shaft 95, which, through a train of gears 96, 97 and 98 within the hollow of the standard 31, is driven from the upper shaft 49, the ratio and arrangement of these gears being such that the two shafts are caused to rotate in unison and in the same direction. As shown in Figs. I and V, the lower shaft 95 is journalled in bushings 99 and 100 respectively in the end wall 5 and in the cross partition 7, and it also has journal support in a bearing 101 in the end wall 6.

Arranged to cooperate individually with the needles 46 within the chamber 15 of the base 1, in stitch formation is a gang of loopers 102 which receive their loop taking and needle avoiding movements through mechanism actuated from the lower shaft 95. This mechanism includes a crank 103 on the shaft 95 within the chamber 14, whereof the pitman 104 connects at its lower end with a horizontal arm 105 on a rock shaft 106 which extends through a bearing in the portion 7 of the cross partition of the base, and which is also journalled in a bearing 107 in the side wall 3. Secured to the protruding end of the rock shaft 106 within the chamber 15 is an upright arm 108 which, through a collapsible link 109, is connected to the carrier 110 for the loopers 102. As shown in Fig. I, the looper carrier 110 is mounted to swing on a stud 111 extending laterally from a sleeve 112 which is affixed to a rock shaft 113 extending parallel to the rotary shaft 95 within the chamber 15. At one end the shaft 113 is journalled in a bearing 115 in the end wall 5 of the base 1, and at the other end in a bearing 116 in a lug 117 projecting from the partition 7. Through rocking of the shaft 113 as just described, the loopers 102 are given their loop taking movements. Needle avoiding movements are imparted to the loopers 102 through a pendant arm 118 on the rock shaft 113 connected to the strap 119 of an eccentric 120 affixed to the lower shaft 95 within the chamber 15.

En route from suitable supply sources (not illustrated) the looper threads designated T' (Figs. V, VI, IX) are directed to eyes 121 in the upper outwardly expanded end 122 of a partially split upright tube 123, which, at its bottom, is anchored in the base 1 at the rear of the standard 31, (Figs. V, IX, XIV). By way of the interior of the tube 123, the looper threads T' pass

to guide eyes 125 near the bottom of said tube and are thereby directed into a guide groove 126 in the upper surface of the top wall 2 of the base 1 (Fig. VI), said slot extending down into the depressed margin 21 beneath the cover plate 17 and leading to eyes in a guide 127 at the interior of the extended portion 10 of the chamber 15. From the lug 127 the looper threads T' pass directly to individual tensions 128 (Figs. I and V) at the forward end of the portion 7 of the cross partition in the base 1. Between the tensions 128 and the loopers 102 is a rotary take-up of well-known construction generally indicated by the numeral 129 in Figs. I, V, VI and XI by which the looper threads T' are properly controlled. Attention is directed to the fact that the tube 123 is throughout that portion of its length which is above the work support, and that its open side is at the right as considered in Fig. VI. Accordingly threading is made easy on the one hand, and on the other hand, the threads are protected from the work as the latter is fed across the top of the base 1.

The feed mechanism of the machine is generally similar to that featured in U. S. Patent 2,048,874 granted to F. A. Kucera on July 28, 1936. As shown, it includes a feed dog 130 which is secured, with capacity for vertical adjustment, to a carrier in the form of a bar 131 which is yoked to extend over, as well as beneath, the shaft 95 as best seen in Fig. III, said bar being pivotally connected at its rear end by a pin 132 to the top of an upright rocker 133. As shown in Figs. III and V, the rocker 133 secured to a rock shaft 135, which, at one end, is journalled in a bearing 136 in the end wall 5 and at the other end in a bearing 137 in a post 138 integrally formed with the machine base. From Fig. V, it will be further observed that the rock shaft 135 extends outward through the end wall 5 and at its protruding end has a horizontal arm 139 which is connected, through a pitman 140 with a crank 141 on the protruding end of the lower shaft 95. As a result of these connections, it will be seen that horizontal or feed movements are imparted to the feed dog 130. Referring to Fig. III, the underslung portion 142 of the feed dog carrier 131 has a pivotal connection at 143 with the strap arm 145 of an eccentric 146 on the lower shaft 95 within the chamber 15 whereby the necessary lift movements are induced in the feed dog 130.

In accordance with my invention, the hollow of the base 1 is utilized as a sump for lubricating oil which is normally maintained at about the level indicated at L in Fig. I and into which dips the periphery of a disk 150 mounted on the lower shaft 95 directly adjacent the gear wheel 98, which, it is to be noted is well above the lubricant level. Through the rapid rotation of the disk 150 during the operation of the machine, oil is dispersed in the form of a mist within the hollow of the standard 31. Part of this dispersed oil is deposited on the gears 96, 97, and 98, while some of it enters a port 151 on the machine frame to lubricate the right hand end bearing 52 for the upper shaft 49, and some of it is deposited on the intermediate bearing 51 for said shaft. Some of the dispersed oil is, moreover, trapped in an auxiliary reservoir 152 formed within said standard as an integral part of the machine frame. Extending downward from the auxiliary reservoir 152 through a web 155 within the base 1 is a duct 156 (Figs. I and IX), which, at its lower end, connects with a channel groove 157 along the bottom of the rear wall 4 of said base. As shown in Fig. VII, the channel 157 has lateral branches 158, 159 respectively at the bottom of the front wall 5 and at the bottom of the partition 7.

Extending upward from branch 158 (Fig. X) in the end wall 5 are ducts 160, 161 and 162 which respectively deliver oil to the bearings 99, 115 and 136 for the lower shaft 95, the looper shaft 113 and the feed rock shaft 135. From the tops of the ducts 160, 161 and 162 in turn lead lateral wick tubes 163, 164 and 165 (Fig. X) which carry oil respectively to the feed lift crank 141 at the outer end of the lower shaft 95, to the left hand end pivot for the collapsible link 109, and to the upper pivot bearings on the feed rocker 133. Extending upward from the oil channel branch 159 (Fig. XI) in the partition 7 is a duct 167 which carries oil to the intermediate bearing 100 for the lower shaft 95, while a lateral bore 168 connecting with said branch conducts oil to the bearing 116 for the looper shaft 113. Another lateral bore 169 from the duct 167 leads forwardly through the horizontal partition 11 to a vertical bore 170 in the front wall 3 of the base 1, and a wick tube 171 extending from the top of said bore carries oil to the right hand end pivot of the collapsible link 109. From the top of the vertical duct 167 a lateral wick tube 172 carries oil to the eccentric 103 on the lower shaft 95 within the chamber 14. Another duct 173 (Figs. V and XIV) leading vertically from the channel 157 in the post 138 carries oil to the bearing 137 for the feed rock shaft 135 and a wick tube 175 extending laterally from the upper end of said duct conveys oil to the looper rocking eccentric on the lower shaft 95. The excess oil released from the lubricated parts within the chamber 15 is filtered of dirt or lint which may be carried along with it by a horizontal screen 176 extending crosswise of an opening 177 in the horizontal portion 11 and removably secured to the bottom of said partition by screws 178. At the center, the filter screen 176 has a spherical upward bulge 179 which prevents filming of the oil and choking of said screen.

Referring once more to Fig. I, it will be apparent that some of the oil dispersed within the hollow of the standard 31 also finds its way into the bearing hub 180 of the intermediate transmission gear wheel 97 which rotates freely about a transverse axle shaft 181 whereof the ends are secured in opposite side walls of said standard, and which is confined against axial shifting by thrust collars shown at 182 and 183. It is to be further noted that the right hand end bearing 101 for the lower shaft 95 is also automatically lubricated by the dispersed oil.

In order that the level of the oil supply in the base may be checked from time to time, there is provided a depth gauge rod 185 (Figs. I and V) which passes down through an opening 186 in a boss 187 on the horizontal portion 10 of the partition within the base 1 which forms the bottom of the horizontal offset of the chamber 15. At the top, the gauge rod 185 has a grasp knob 188, while its lower end its flattened as at 189 and dips into the oil. Thus upon removal of the cover plate 17, the knob 188 is conveniently accessible for the purpose of withdrawing the gauge rod to check the level of the oil supply within the base.

A guard plate 190 secured to a depressed flange extension 191 of the base 1 at the left hand

end thereof confines oil which may be flung or dropped from the exterior parts 139 and 140 of the feed mechanism.

Except as hereinafter particularly pointed out, the modified embodiment of my invention illustrated in Figs. XXI to XXVI inclusive is identical with the first described, and accordingly in order to obviate the necessity for repetitive description, all the elements in the modification having their counterparts in said first embodiment are identified by the same reference characters.

One difference to be noted in the modification is that the tensions 128a for the looper threads are vertically arranged and supported by the depressed horizontal portion 10 of the partition in the base.

Another departure from the first described embodiment is that in the modification, a supplemental feed or puller means is incorporated with the machine. As shown, this puller means includes a pair of superposed rollers 199 and 200 which are located beyond the needles 46 and the presser foot 55 as considered with respect to the direction of feeding, see Figs. XXIII and XXIV. The lower puller roller 200 is mounted on a shaft 202 within the rear part of the base 1 which extends directly over a depression 131a in the feed dog carrier 131, said shaft being journalled in bearing bushings 203, 204 and 205 respectively set into the end wall 5, the partition 7 and the vertical web 155. Mounted on the shaft 202, within the chamber 15, is a clutch comprehensively designated 207, which, through a pitman 208, is operated from an adjustable crank 209 on a countershaft 210 also within said chamber at the front of the latter. As shown in Figs. XXI and XXIII, the countershaft 210 extends parallel with the lower shaft 95 of the machine and is driven from said shaft 95 through a pair of intermeshing spur gears 211, 212. The upper puller roller 199 contacts peripherally with the top of the lower roller 200 which protrudes through a slot 213 in the wall 2 of the base, and said upper feed roller is journalled in a yoke 214 at the bottom of an auxiliary presser bar 215 which is guided for up and down movement in a bracket 216 secured by screws 217 to the rear side of the needle 33. Within the hollow of the bracket 216 is a helical spring 218 which, at its lower end bears upon a collar 219 on the auxiliary presser bar 215, the pressure of the spring being regulatable by an adjustable screw sleeve 220 against which its upper end of the spring abuts as clearly shown in Fig. XXIV, said sleeve serving as the top guide bearing for the auxiliary bar. The bearings 203 and 204 are lubricated with oil conducted to them respectively from the oil channel branches 158 and 159 at the bottoms of the end base wall 5, and the partition 7 by way of vertical ducts 221 and 222 (Fig. XXIII). The bearing 205 for the shaft 202 is supplied with oil from the main distributing channel 157 at the bottom of the rear base wall 4 via the vertical duct 156 in the web 206. The disk shown at 150a in Figs. XXI and XXIII which, in the modification, is relied upon to disperse the oil within the hollow of the standard 31, is mounted on the countershaft 210 adjacent the gear wheel 212. As further shown in Figs. XXI and XXIII, the countershaft 210 is journalled in bearing sleeves 225 and 226 respectively set into integral bosses 227 and 228 on the base 1 within the chamber 16. The bearings 225 and 226 receive oil by way of ports 229 and 230 in the tops of the bosses 227 and 228. The crank on the countershaft 210 is accessible for convenience of adjustment through an opening 231 in the front side wall 3 of the base 1 upon removal of a cover plate 232 which normally closes said opening.

From the foregoing, it will be apparent that I have provided an automatic circulating lubricating system whereby all the moving parts within the base, as well as within the hollow of the standard of the machine are constantly and effectively lubricated, the parts within the needle head being automatically lubricated as previously explained herein through splash action.

It will also be apparent that I have provided for the accommodation of all the parts except for those directly instrumental in the stitch formation, within the machine frame, particularly the spring for the presser bar and the tensions respectively for the needle and looper threads, all of which latter are shielded from contamination by the oil dispersed within different chambers or compartments of the machine frame. The machine is thus entirely fool-proof as far as lubrication is concerned and needs no attention in this regard except for replenishing the oil in the base and in the needle head at protracted intervals.

Having thus described my invention, I claim:

1. A sewing machine comprising a frame with a hollow base having top and bottom walls, front and rear side walls, end walls, and a cross partition subdividing the base into two adjacent chambers of which the one contains a supply of lubricating oil and is completely enclosed, and the other is partly open for access from the exterior; drive mechanism within the first chamber including moving means for taking oil from the supply in the base and dispersing it to automatically lubricate said mechanism; looper mechanism within the second chamber; feed mechanism with some of its parts within the second chamber and some of them externally thereof; means for trapping part of the oil dispersed in the first chamber at a level above the looper and feed mechanisms for conduction by gravity through ducts in the walls of the base to the various moving parts of said looper and feed mechanisms.

2. A sewing machine according to claim 1, in which the top and bottom walls of the base are extended over and beneath the parts of the feeding mechanism exterior to the second chamber, and in which a supplemental wall encloses said parts.

3. A sewing machine according to claim 1, in which the portion of the rear wall of the base constituting the back of the second chamber is in the form of a removable plate.

4. A sewing machine comprising a frame with a hollow base having top and bottom walls, front and rear side walls, end walls, and a cross partition subdividing the base into two adjacent chambers of which the one contains a supply of lubricating oil and is completely enclosed, and the other is partially open for convenience of access thereto from the exterior; drive mechanism within the first chamber including means for taking oil from the supply and dispersing it to automatically lubricate said mechanism; looper mechanism within the second chamber; feed mechanism with some of its parts within the second chamber and some of them externally thereof; an open auxiliary reservoir above the lubricant level within the base for trapping some of the lubricant dispersed as aforesaid; a main distribut-

ing channel at the bottom of one of the side walls of the base receiving oil from the auxiliary reservoir, said channel having transverse branches in the bottom of the outer end wall of the second chamber and in the bottom of the partition; ducts extending upward from the distributing channel and its branches; and wick tubes extending laterally from the tops of certain of the ducts, certain of said wick tubes carrying lubricant to moving parts of the looper and feed mechanisms in the second chamber, and others carrying lubricant to the moving parts of the feed mechanism which are external to said second chamber.

5. A sewing machine comprising a hollow base with two adjacent isolated chambers, one of said chambers containing a supply of lubricating oil and having a portion underlying the other chamber; drive mechanism within the first chamber including means for taking oil from the supply and dispersing it to automatically lubricate said mechanism; looper and feed mechanisms in the second chamber; means for trapping some of the oil dispersed in the first chamber and for conducting it through the walls of the base to the various moving parts of the looper and feed mechanisms in the second chamber; and a screen extending crosswise of an opening in the bottom of the second chamber to filter excess oil which drips from the feed and looper mechanism before such oil is returned to the supply in the first chamber, said screen having an upward bulge to prevent filming of the oil thereover.

6. A sewing machine comprising a frame with a hollow base having top and bottom walls, front and rear side walls, end walls, and a cross partition subdividing it into two adjacent chambers of which the first contains a supply of lubricating oil, said partition having a horizontal portion which forms the bottom of the second chamber with provision of a narrow interspace between it and the bottom wall of the base; drive mechanism within the first chamber with means for taking oil from the supply and dispersing it for the automatic lubrication of said mechanisms; feed and looper mechanisms within the second chamber; means within the first chamber for trapping some of the oil dispersed as aforesaid and for conducting it through the walls of the base to the moving parts of the feed and looper mechanisms within the second chamber; and a screen extending crosswise of an opening in a bottom of the second chamber to filter excess oil which drips from the feed and looper mechanisms before such oil is returned to the supply in the first chamber, said screen having an upward bulge to prevent filming of the oil thereover.

7. A sewing machine comprising a hollow base with two adjacent isolated chambers, one of said chambers containing a supply of lubricating oil, and the other chamber having a horizontal offset which partially overlies the first chamber; driving mechanism in the first chamber including means for taking oil from the supply and dispersing it to automatically lubricate said mechanism; looper mechanism within the second chamber; looper thread tensions in the horizontal offset of the second chamber; a cover plate closing an access opening in the top of the base into the horizontal offset of the second chamber; and quick releasable securing means for the cover including an elongate aperture in said cover, and a bolt with an elongate head corresponding in size with the aperture in the cover and a screw shank which passes down through the aperture and engages into the bottom of the aforesaid offset of the second chamber, the bolt head having at the bottom of its opposite ends camming surfaces to override the side edges of the aperture in the cover and clamp it down as the bolt is rotated through a quarter turn.

8. A sewing machine comprising a frame with a hollow base having top and bottom walls, front and rear side walls, and a cross partition subdividing the base into two adjacent chambers of which one contains a supply of lubricant oil, said partition defining in the second chamber a horizontal offset which partly overlies the first chamber and accommodates looper thread tensions; drive mechanism in the first chamber including means for taking oil from the supply and dispersing it to automatically lubricate said mechanism; looper and feed mechanisms in the second chamber; means for trapping part of the oil dispersed in the first chamber and for conducting it through the walls of the base to the moving parts of the looper and feed mechanisms in the second chamber; a depth gauge rod extending with a tight fit down through an aperture in the bottom of the horizontal offset of the second chamber with its lower end dipping into the oil supply in the first chamber, and with its upper end accessible in said offset for convenience of withdrawing the rod; and a retractable top cover for the horizontal offset of said second chamber.

9. A sewing machine comprising a frame with a hollow base having top and bottom walls, front and rear side walls, and a cross partition subdividing the base into two adjacent chambers of which one contains a supply of lubricant oil, said partition defining in the second chamber a horizontal offset which partly overlies the first chamber and accommodates looper thread tensions; drive mechanism in the first chamber including means for taking oil from the supply and dispersing it to automatically lubricate said mechanism; looper and feed mechanisms in the second chamber; means for trapping part of the oil dispersed in the first chamber and for conducting it through the walls of the base to the moving parts of the looper and feed mechanisms in the second chamber; a retractable cover for a top opening into the offset portion of the second chamber; means for conducting the looper threads to the tensions including an upstanding tube on the base adapted to be traversed by the threads and having guide eyes adjacent the top and bottom thereof; and a groove in the upper surface of the top wall of the base by way of which the threads pass from the guide eyes at the bottom of the tube beneath the cover aforesaid into the offset portions of the second chamber en route to the tensions.

10. A sewing machine according to claim 9, in which the lower end of the tube is anchored in the machine base and in which the portion of said tube above the base is split for convenience of initially passing the threads through its guide eyes.

11. A sewing machine according to claim 9, in which the cover fits within a marginal recess around the opening, and in which the groove extends down into said marginal depression to a level below the cover.

12. A sewing machine according to claim 9, in which a standard rises from the base at one end and supports an overhanging needle arm; and in which the guide tube for the looper threads

is located, out of the way, to the rear of the standard.

13. A sewing machine comprising a frame with a horizontal work support, an overhanging arm, and a closed hollow head at the free end of the arm; a well for lubricant at the bottom of the head; an endwise reciprocating needle bar; a guide bushing through which the needle bar extends upward into the head, the top of said bushing being above the level of the lubricant in the well; needle operating mechanism within the head including a moving member which takes lubricant from the well and disperses it to lubricate said mechanism; and vertically arranged shield means to prevent direct splash of the lubricant from said mechanism onto the guide bushing for the needle bar.

14. A sewing machine comprising a frame with a horizontal work support, an overhanging arm, and a closed hollow head at the free end of the arm; a well for lubricant at the bottom of the head; an endwise reciprocating needle bar; a guide bushing through which the needle bar extends upward into the head, the top of said bushing being above the level of the lubricant in the well; needle operating mechanism within the head including a member which takes lubricant from the well and disperses it to lubricate said mechanism; an endwise shiftable presser bar; another guide bushing like that for the needle bar through which the presser bar extends upward into the head; and vertically arranged shield means to prevent direct splash of lubricant from said mechanism onto the aforesaid guide bushings.

15. A sewing machine according to claim 13, in which the overhanging arm is hollow and has a transverse portion therein to form the back of the needle head; and including a horizontal leaf spring for the presser bar having its anchorage with the arm and extending through the partition into the hollow of the head, said opening being also guarded against splash of lubricant through it by the shield means.

16. A sewing machine according to claim 13, in which the overhanging arm is hollow and has a transverse portion therein to form the back of the needle head; and including a horizontal leaf spring for the presser bar having its anchorage with the arm and extending through the partition into the hollow of the head, and a separate shield also within the head to prevent lubricant from splashing through the opening in the partition aforesaid into the hollow of the arm.

17. A sewing machine comprising a frame with a base, a standard rising from the base and supporting a hollow overhanging arm with a hollow head at its free end, and a cross partition forming the back of the head and separating the hollow of the latter from the hollow of the arm; needle operating mechanism within the arm; a presser foot attached to a presser bar which extends upward into the head; and a horizontal leaf spring with one end anchored within the hollow of the arm and with its other end extending through a clearance opening in the partition into the hollow of the arm to engage the presser bar.

18. A sewing machine comprising a frame with a hollow base containing lubricant, a hollow communicating standard rising from the base and supporting a hollow overhanging arm with a hollow head at its free end also containing a supply of lubricating oil, and cross partitions setting apart a central chamber within the arm between the standard and the head; needle operating mechanism within the head lubricated by oil dispersed from the supply in the latter; drive mechanism within the hollow of the standard lubricated by oil dispersed from the supply in the base; a needle actuating shaft within the arm extending horizontally from the drive mechanism within the standard through bearings in the partitions to the needle operating mechanism in the head; a presser foot attached to a presser bar which extends upward into the head; a leaf spring anchored within the central chamber of the arm and extending through a clearance opening in one of the partitions into the head to engage the presser bar; and shield means to prevent dispersed oil from passing from the head into the central chamber of the arm.

19. A sewing machine according to claim 18, including a rock shaft within the central chamber of the arm journalled within the central chamber of the arm and extending at one end through a bearing in one of the partitions into the needle head; means on the rock shaft within the needle head for lifting the presser bar; and an actuating lever secured to the rock shaft within said central chamber of the arm and extending through a clearance opening in the side of the overhanging arm.

20. A sewing machine according to claim 18, including needle thread tensions within the central chamber of the arm; a rock shaft journalled within the central chamber of the arm and extending at one end through a bearing in one of the partitions into the needle head; means on the rock shaft within the needle head for lifting the presser bar; means on the rock shaft within the central chamber of the arm for controlling the thread tensions; and an actuating lever secured to the rock shaft within said central chamber and extending to the exterior through a clearance opening in the side of the overhanging arm.

21. A sewing machine comprising a closed hollow base which at its bottom contains a supply of lubricating oil; actuating devices for stitch forming and feeding mechanisms within the base; means for taking oil from the supply in the base and dispersing it upwardly within the base to lubricate the stitch forming and feeding mechanisms; a pair of opposing puller feed rollers; and mechanism also enclosed within the base for lubrication by the dispersed oil, to actuate the puller rollers.

22. A sewing machine comprising a closed hollow base which contains a supply of lubricating oil; actuating devices for switch forming means and feeding mechanisms within the base; means for taking oil from the supply in the base and dispersing it upwardly within the base; puller feed means including a pair of opposing rollers; and actuating means for the rollers including a shaft which extends into the hollow of the base and carries one of the rollers, and mechanism for rotating said shaft also enclosed within the base for lubrication by the dispersed oil.

23. A sewing machine comprising a closed hollow base which contains a supply of lubricating oil; stitch forming and feeding mechanisms within the base; a rotary shaft from which said mechanisms derive their motion, journalled within the base; a pair of opposing puller feed rollers; a clutch within the base and connections between it and the rotary shaft for intermittently rotating one of the puller rollers; and means

for taking oil from the supply and dispersing it within the base to automatically lubricate the shaft bearings, the stitch forming and feeding mechanisms and the clutch and its connections.

24. A sewing machine comprising a closed hollow base which contains a supply of lubricating oil; stitch forming and feeding mechanisms within the base; a rotary shaft from which said mechanisms derive their motion, journalled within the base; a pair of opposing puller feed rollers; a shaft for one of the puller rollers journalled within the base; a clutch mounted on said roller shaft; means on the rotary shaft for actuating the clutch to intermittently rotate the roller shaft; and means for taking oil from the supply and dispersing it within the base to automatically lubricate the stitch forming and feeding mechanisms, and the enclosed parts of the puller mechanism.

25. A sewing machine comprising a closed hollow base which contains a supply of lubricating oil; stitch forming and feeding mechanisms within the base; a rotary shaft, from which said mechanisms derive their motion, journalled within the base; a pair of opposing puller feed rollers; a shaft for one of the puller rollers journalled within the base; a clutch mounted on said roller shaft; a countershaft also journalled within the base; gear connections between the rotary shaft and the countershaft within the base; connections between the countershaft and the clutch for intermittently rotating the roller shaft; and means for taking oil from the supply and dispersing it within the base to automatically lubricate the parts of the stitch forming and feeding mechanisms and the enclosed parts of the puller mechanism.

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